

Amendments to the Claims

1. (Currently amended) A ~~laminated material~~ membrane casted material ~~made of~~ a segregating membrane and a segregating membrane supporting material in which the segregating membrane is ~~laminated~~ casted on the segregating membrane supporting material, the membrane casted material comprising:

a segregating membrane including at least ~~a choice~~ one member selected from the group consisting of polysulfone-based, polyvinylidene fluoride-based, polyamide-based, polyimide-based, ~~or~~ and polyacrylonitrile-based high polymer materials, and

a segregating membrane supporting material ~~wherein,~~ in which fibers are assembled in three-dimensions to form non-woven fabric, the non-woven fabric is processed by thermo-compression to join together fibers, which make up the non-woven fabric in sheet form, making the segregating membrane supporting material, and the non-woven fabric including includes at least 10 weight % polyacrylonitrile-based synthetic fibers having a fiber length of 1mm-25mm and is processed by thermo-compression making a segregating membrane supporting material with overall bulk density 40% to 75% of the density of the fibers which make up the non-woven fabric, and

wherein polyacrylonitrile-based synthetic fibers included in the non-woven fabric of the segregating membrane supporting material are selected to be dissoluble in amide-based solvents or in sulfoxide-based solvents as a mutual solvent for forming the segregating membrane to bind the segregating membrane and segregating membrane supporting material.

2. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 1 wherein the segregating membrane supporting material is made from non-woven fabric, including 10 weight % to 100 weight % polyacrylonitrile-based synthetic fibers, which is thermo-compressed.

3. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 1

wherein the segregating membrane supporting material is made from non-woven fabric, including 20 weight % to 70 weight % polyacrylonitrile-based synthetic fibers, which is thermo-compressed.

4. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 1 wherein the segregating membrane supporting material is made from non-woven fabric, including 30 weight % to 60 weight % polyacrylonitrile-based synthetic fibers, which is thermo-compressed.

5. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 1 wherein the segregating membrane supporting material is made from non-woven fabric, including 40 weight % to 60 weight % polyacrylonitrile-based synthetic fibers, which is thermo-compressed.

6. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 1 wherein size of polyacrylonitrile-based synthetic fiber included in non-woven fabric of the segregating membrane supporting material is diameter of 3.5 to 49.6 μm .

7. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 1 wherein permeability of the segregating membrane supporting material is 0.5 $\text{cm}^3/\text{cm}^2/\text{sec}$ to 10 $\text{cm}^3/\text{cm}^2/\text{sec}$.

8. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 1 wherein non-woven fabric of the segregating membrane supporting material includes polyacrylonitrile-based synthetic fibers and binder fibers.

9. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 8 wherein the binder fibers of the segregating membrane supporting material include a ~~choice~~ membrane selected from the group consisting of polyester fibers, polyolefin fibers, nylon fibers, aramide fibers, ~~or~~ and polyphenylene sulfide fibers.

10. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 8 wherein the binder fibers of the segregating membrane supporting material are low melting point polyester fibers.

11. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 8 wherein the binder fibers of the segregating membrane supporting material are un-extended polyester fibers.

12. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 8 wherein the non-woven fabric of the segregating membrane supporting material includes 20 weight % to 90 weight % binder fibers.

13. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 1 wherein thickness of the segregating membrane supporting material made from thermo-compressed non-woven fabric is 50 μm to 150 μm .

14. (Withdrawn) A method of manufacturing a laminated material in which a segregating membrane is laminated on a segregating membrane supporting material wherein fibers are assembled in three-dimensions to form non-woven fabric, and non-woven fabric is processed by thermo-compression to join together fibers, which make up

the non-woven fabric in sheet form, making the segregating membrane supporting material,

the step comprising of:

processing by thermo-compression of the non-woven fabric including at least 10 weight % polyacrylonitrile-based synthetic fibers having a fiber length of 1mm-25mm to make a segregating membrane supporting material with overall bulk density 40% to 75% of the density of the fibers which make up the non-woven fabric,

manufacturing the segregating membrane supporting material wherein polyacrylonitrile-based synthetic fibers included in the non-woven fabric are dissoluble in amide-based solvents or in sulfoxide-based solvents as a mutual solvent for forming the segregating membrane, and

laminating the segregating membrane supporting material with the segregating membrane including at least a choice of polysulfone based, polyvinylidene fluoride-based, polyamide-based, polyimide-based, or polyacrylonitrile-based high polymer materials.

15. (Withdrawn) A method of manufacturing a laminated material as recited in claim 14 wherein the segregating membrane supporting material is made from non-woven fabric, including 10 weight % to 100 weight % polyacrylonitrile-based synthetic fibers, which is thermo-compressed.

16. (Withdrawn) A method of manufacturing a laminated material as recited in claim 14 wherein the segregating membrane supporting material is made from non-woven fabric, including 20 weight % to 70 weight % polyacrylonitrile-based synthetic fibers, which is thermo-compressed.

17. (Withdrawn) A method of manufacturing a laminated material as recited in claim 14 wherein the segregating membrane supporting material is made from non-woven fabric, including 30 weight % to 60 weight % polyacrylonitrile-based synthetic fibers, which is thermo-compressed.

18. (Withdrawn) A method of manufacturing a laminated material as recited in claim 14 wherein the segregating membrane supporting material is made from non-woven fabric, including 40 weight % to 60 weight % polyacrylonitrile-based synthetic fibers, which is thermo-compressed.

19. (Withdrawn) A method of manufacturing a laminated material as recited in claim 14 wherein the segregating membrane supporting material is formed by using polyacrylonitrile-based synthetic fibers of size of diameter of 3.5 to 49.6 μm .

20. (Withdrawn) A method of manufacturing a laminated material as recited in claim 14 wherein the segregating membrane supporting material is made from non-woven fabric which is thermo-compressed to give a permeability of 0.5 $\text{cm}^3/\text{cm}^2/\text{sec}$ to 10 $\text{cm}^3/\text{cm}^2/\text{sec}$.

21. (Withdrawn) A method of manufacturing a laminated material as recited in claim 14 wherein the segregating membrane supporting material is made by using non-woven fabric including polyacrylonitrile-based synthetic fibers and binder fibers.

22. (Withdrawn) A method of manufacturing a laminated material as recited in claim 21 wherein the segregating membrane supporting material is made by using a choice of polyester fibers, polyolefin fibers, nylon fibers, aramide fibers, or polyphenylene sulfide fibers as binder fibers.

23. (Withdrawn) A method of manufacturing a laminated material as recited in claim 21 wherein the segregating membrane supporting material is made by using low melting point polyester fibers as binder fibers.

24. (Withdrawn) A method of manufacturing a laminated material as recited in claim 21 wherein the segregating membrane supporting material is made by using un-extended polyester fibers as binder fibers.

25. (Withdrawn) A method of manufacturing a laminated material as recited in claim 21 wherein the segregating membrane supporting material includes 20 weight % to 90 weight % binder fibers.

26. (Withdrawn) A method of manufacturing a laminated material as recited in claim 14 wherein thickness of the segregating membrane supporting material made from thermo-compressed non-woven fabric is 50 μm to 150 μm .

27. (Withdrawn) A method of manufacturing a laminated material as recited in claim 14 wherein the segregating membrane supporting material is made from non-woven fabric which is transported through and sandwiched between two rollers for thermo-compression processing.

28. (Withdrawn) A method of manufacturing a laminated material as recited in claim 27 wherein one of the two rollers for thermo-compression processing is a heating roller to make the segregating membrane supporting material.

29. (Withdrawn) A method of manufacturing a laminated material as recited in claim 27 wherein thermo-compression processing is by two heating rollers to make the segregating membrane supporting material.

30. (Withdrawn) A method of manufacturing a laminated material as recited in claim 27 wherein the segregating membrane supporting material is made from non-woven fabric which is thermo-compressed by heating roller with a surface temperature of 200°C to 250°C.

31. (Withdrawn) A method of manufacturing a laminated material as recited in claim 27 wherein non-woven fabric is transported via heating roller at a speed of 20 m/min to 100 m/min.

32. (Currently amended) A ~~laminated material~~ membrane casted material ~~made~~ of a segregating membrane and a segregating membrane supporting material in which ~~a~~ the segregating membrane is ~~laminated on a~~ casted on the segregating membrane supporting material, the membrane casted material comprising:

a segregating membrane including at least ~~a choice~~ one member selected from the group consisting of polysulfone-based, polyvinylidene fluoride-based, polyamide-based, polyimide-based, ~~or~~ and polyacrylonitrile-based high polymer materials, and

a segregating membrane supporting material ~~wherein~~, in which fibers are assembled in three-dimensions to form non-woven fabric, the non-woven fabric is processed by thermo-compression to join together fibers, which make up the non-woven fabric in sheet form, making the segregating membrane supporting material, and the non-woven fabric ~~including~~ includes at least 10 weight % polyacrylonitrile-based synthetic fibers and low melting point polyester binder fibers and is processed by thermo-compression making a segregating membrane supporting material with overall bulk density 40% to 75% of the density of the fibers which make up the non-woven fabric, and

wherein polyacrylonitrile-based synthetic fibers included in the non-woven fabric of the segregating membrane supporting material are selected to be dissoluble in amide-based solvents or in sulfoxide-based solvents as a mutual solvent for forming the segregating membrane to bind the segregating membrane and segregating membrane supporting material.

33. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 32 wherein the segregating membrane supporting material is made from non-woven fabric, including 10 weight % to 100 weight % polyacrylonitrile-based synthetic fibers, which is thermo-compressed.

34. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 32 wherein the segregating membrane supporting material is made from non-woven fabric,

including 20 weight % to 70 weight % polyacrylonitrile-based synthetic fibers, which is thermo-compressed.

35. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 32 wherein the segregating membrane supporting material is made from non-woven fabric, including 30 weight % to 60 weight % polyacrylonitrile-based synthetic fibers, which is thermo-compressed.

36. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 32 wherein the segregating membrane supporting material is made from non-woven fabric, including 40 weight % to 60 weight % polyacrylonitrile-based synthetic fibers, which is thermo-compressed.

37. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 32 wherein size of polyacrylonitrile-based synthetic fiber included in non-woven fabric of the segregating membrane supporting material is diameter of 3.5 to 49.6 μm .

38. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 32 wherein length of polyacrylonitrile-based synthetic fiber included in non-woven fabric of the segregating membrane supporting material is 1mm to 25mm.

39. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 32 wherein permeability of the segregating membrane supporting material is 0.5 $\text{cm}^3/\text{cm}^2/\text{sec}$ to 10 $\text{cm}^3/\text{cm}^2/\text{sec}$.

40. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 32 wherein the segregating membrane supporting material includes 20 weight % to 90 weight % binder fibers.

41. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 32 wherein thickness of the segregating membrane supporting material made from thermo-compressed non-woven fabric is 50 μm to 150 μm .

42. (Currently amended) A ~~laminated material~~ membrane casted material made of a segregating membrane and a segregating membrane supporting material in which the segregating membrane is ~~laminated~~ casted on the segregating membrane supporting material, the membrane casted material comprising:

a segregating membrane including at least ~~a choice~~ one member selected from the group consisting of polysulfone-based, polyvinylidene fluoride-based, polyamide-based, polyimide-based, or and polyacrylonitrile-based high polymer materials, and

a segregating membrane supporting material ~~wherein,~~ in which fibers are assembled in three-dimensions to form non-woven fabric, the non-woven fabric is processed by thermo-compression to join together fibers, which make up the non-woven fabric in sheet form, making the segregating membrane supporting material, and the non-woven fabric ~~including~~ includes at least 10 weight % polyacrylonitrile-based synthetic fibers and un-extended polyester binder fibers and is processed by thermo-compression making a segregating membrane supporting material with overall bulk density 40% to 75% of the density of the fibers which make up the non-woven fabric, and

wherein polyacrylonitrile-based synthetic fibers included in the non-woven fabric of the segregating membrane supporting material are selected to be dissoluble in amide-based solvents or in sulfoxide-based solvents as a mutual solvent for forming the segregating membrane to bind the segregating membrane and segregating membrane supporting material.

43. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 42 wherein the segregating membrane supporting material is made from non-woven fabric, including 10 weight % to 100 weight % polyacrylonitrile-based synthetic fibers, which is thermo-compressed.

44. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 42 wherein the segregating membrane supporting material is made from non-woven fabric, including 20 weight % to 70 weight % polyacrylonitrile-based synthetic fibers, which is thermo-compressed.

45. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 42 wherein the segregating membrane supporting material is made from non-woven fabric, including 30 weight % to 60 weight % polyacrylonitrile-based synthetic fibers, which is thermo-compressed.

46. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 42 wherein the segregating membrane supporting material is made from non-woven fabric, including 40 weight % to 60 weight % polyacrylonitrile-based synthetic fibers, which is thermo-compressed.

47. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 42 wherein size of polyacrylonitrile-based synthetic fiber of the segregating membrane supporting material is diameter of 3.5 to 49.6 μm .

48. (Currently amended) A ~~laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 42

wherein length of polyacrylonitrile-based synthetic fiber of the segregating membrane supporting material is 1mm to 25mm.

49. (Currently amended) ~~A laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 42 wherein permeability of the segregating membrane supporting material is 0.5 cm³/cm²/sec to 10 cm³/cm²/sec.

50. (Currently amended) ~~A laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 42 wherein the segregating membrane supporting material includes 20 weight % to 90 weight % binder fibers.

51. (Currently amended) ~~A laminated material of a segregating membrane and a segregating membrane supporting~~ membrane casted material as recited in claim 42 wherein thickness of the segregating membrane supporting material made from thermo-compressed non-woven fabric is 50 μm to 150 μm.

52. (Withdrawn) A method of manufacturing a laminated material in which a segregating membrane is laminated on a segregating membrane supporting material wherein fibers are assembled in three-dimensions to form non-woven fabric, and non-woven fabric is processed by thermo-compression to join together fibers, which make up the non-woven fabric in sheet form, making the segregating membrane supporting material,

the step comprising of:

processing by thermo-compression of the non-woven fabric including at least 10 weight % polyacrylonitrile-based synthetic fibers and low melting point polyester binder fibers to make a segregating membrane supporting material with overall bulk density 40% to 75% of the density of the fibers which make up the non-woven fabric,

manufacturing the segregating membrane supporting material wherein polyacrylonitrile-based synthetic fibers included in the non-woven fabric are dissoluble in

amide-based solvents or in sulfoxide-based solvents as a mutual solvent for forming the segregating membrane, and

laminating the segregating membrane supporting material with the segregating membrane including at least a choice of polysulfone based, polyvinylidene fluoride-based, polyamide-based, polyimide-based, or polyacrylonitrile-based high polymer materials.

53. (Withdrawn) A method of manufacturing a laminated material as recited in claim 52 wherein the segregating membrane supporting material is made from non-woven fabric, including 10 weight % to 100 weight % polyacrylonitrile-based synthetic fibers, which is thermo-compressed.

54. (Withdrawn) A method of manufacturing a laminated material as recited in claim 52 wherein the segregating membrane supporting material is made from non-woven fabric, including 20 weight % to 70 weight % polyacrylonitrile-based synthetic fibers, which is thermo-compressed.

55. (Withdrawn) A method of manufacturing a laminated material as recited in claim 52 wherein the segregating membrane supporting material is made from non-woven fabric, including 30 weight % to 60 weight % polyacrylonitrile-based synthetic fibers, which is thermo-compressed.

56. (Withdrawn) A method of manufacturing a laminated material as recited in claim 52 wherein the segregating membrane supporting material is made from non-woven fabric, including 40 weight % to 60 weight % polyacrylonitrile-based synthetic fibers, which is thermo-compressed.

57. (Withdrawn) A method of manufacturing a laminated material as recited in claim 52 wherein the segregating membrane supporting material is made by using polyacrylonitrile-based synthetic fibers having a fiber size of diameter of 3.5 to 49.6 μm .

58. (Withdrawn) A method of manufacturing a laminated material as recited in claim 52 wherein the segregating membrane supporting material is made by using polyacrylonitrile-based synthetic fibers having a fiber length of 1mm to 25mm.

59. (Withdrawn) A method of manufacturing a laminated material as recited in claim 52 wherein the segregating membrane supporting material is thermo-compressed to give a permeability of $0.5 \text{ cm}^3/\text{cm}^2/\text{sec}$ to $10 \text{ cm}^3/\text{cm}^2/\text{sec}$.

60. (Withdrawn) A method of manufacturing a laminated material as recited in claim 52 wherein the segregating membrane supporting material includes 20 weight % to 90 weight % binder fibers.

61. (Withdrawn) A method of manufacturing a laminated material as recited in claim 52 wherein thickness of the segregating membrane supporting material made from thermo-compressed non-woven fabric is $50 \mu\text{m}$ to $150 \mu\text{m}$.

62. (Withdrawn) A method of manufacturing a laminated material as recited in claim 52 wherein the segregating membrane supporting material is made from non-woven fabric which is transported through and sandwiched between two rollers for thermo-compression processing.

63. (Withdrawn) A method of manufacturing a laminated material as recited in claim 62 wherein one of the two rollers for thermo-compression processing is a heating roller to make the segregating membrane supporting material.

64. (Withdrawn) A method of manufacturing a laminated material as recited in claim 62 wherein thermo-compression processing is by two heating rollers to make the segregating membrane supporting material.

65. (Withdrawn) A method of manufacturing a laminated material as recited in claim 62 wherein the segregating membrane supporting material is made from non-

woven fabric which is thermo-compressed by heating roller with a surface temperature of 200°C to 250°C.

66. (Withdrawn) A method of manufacturing a laminated material as recited in claim 62 wherein non-woven fabric is transported via heating roller at a speed of 20 m/min to 100 m/min.

67. (Withdrawn) A method of manufacturing a laminated material in which a segregating membrane is laminated on a segregating membrane supporting material wherein fibers are assembled in three-dimensions to form non-woven fabric, and non-woven fabric is processed by thermo-compression to join together fibers, which make up the non-woven fabric in sheet form, making the segregating membrane supporting material,

the step comprising of:

processing by thermo-compression of the non-woven fabric including at least 10 weight % polyacrylonitrile-based synthetic fibers and un-extended polyester binder fibers to make a segregating membrane supporting material with overall bulk density 40% to 75% of the density of the fibers which make up the non-woven fabric,

manufacturing the segregating membrane supporting material wherein polyacrylonitrile-based synthetic fibers included in the non-woven fabric are dissoluble in amide-based solvents or in sulfoxide-based solvents as a mutual solvent for forming the segregating membrane, and

laminating the segregating membrane supporting material with the segregating membrane including at least a choice of polysulfone based, polyvinylidene fluoride-based, polyamide-based, polyimide-based, or polyacrylonitrile-based high polymer materials.

68. (Withdrawn) A method of manufacturing a laminated material as recited in claim 67 wherein the segregating membrane supporting material is made from non-woven fabric, including 10 weight % to 100 weight % polyacrylonitrile-based synthetic fibers, which is thermo-compressed.

69. (Withdrawn) A method of manufacturing a laminated material as recited in claim 67 wherein the segregating membrane supporting material is made from non-woven fabric, including 20 weight % to 70 weight % polyacrylonitrile-based synthetic fibers, which is thermo-compressed.

70. (Withdrawn) A method of manufacturing a laminated material as recited in claim 67 wherein the segregating membrane supporting material is made from non-woven fabric, including 30 weight % to 60 weight % polyacrylonitrile-based synthetic fibers, which is thermo-compressed.

71. (Withdrawn) A method of manufacturing a laminated material as recited in claim 67 wherein the segregating membrane supporting material is made from non-woven fabric, including 40 weight % to 60 weight % polyacrylonitrile-based synthetic fibers, which is thermo-compressed.

72. (Withdrawn) A method of manufacturing a laminated material as recited in claim 67 wherein the segregating membrane supporting material is made by using polyacrylonitrile-based synthetic fibers having a fiber size of diameter of 3.5 to 49.6 μm .

73. (Withdrawn) A method of manufacturing a laminated material as recited in claim 67 wherein the segregating membrane supporting material is made by using polyacrylonitrile-based synthetic fibers having a fiber length of 1mm to 25mm.

74. (Withdrawn) A method of manufacturing a laminated material as recited in claim 67 wherein the segregating membrane supporting material is thermo-compressed to give a permeability of 0.5 $\text{cm}^3/\text{cm}^2/\text{sec}$ to 10 $\text{cm}^3/\text{cm}^2/\text{sec}$.

75. (Withdrawn) A method of manufacturing a laminated material as recited in claim 67 wherein the segregating membrane supporting material includes 20 weight % to 90 weight % binder fibers.

76. (Withdrawn) A method of manufacturing a laminated material as recited in claim 67 wherein thickness of the segregating membrane supporting material made from thermo-compressed non-woven fabric is 50 μm to 150 μm .

77. (Withdrawn) A method of manufacturing a laminated material as recited in claim 67 wherein the segregating membrane supporting material is made from non-woven fabric which is transported through and sandwiched between two rollers for thermo-compression processing.

78. (Withdrawn) A method of manufacturing a laminated material as recited in claim 77 wherein one of the two rollers for thermo-compression processing is a heating roller to make the segregating membrane supporting material.

79. (Withdrawn) A method of manufacturing a laminated material as recited in claim 77 wherein thermo-compression processing is by two heating rollers to make the segregating membrane supporting material.

80. (Withdrawn) A method of manufacturing a laminated material as recited in claim 77 wherein the segregating membrane supporting material is made from non-woven fabric which is thermo-compressed by heating roller with a surface temperature of 200°C to 250°C.

81. (Withdrawn) A method of manufacturing a laminated material as recited in claim 77 wherein non-woven fabric is transported via heating roller at a speed of 20 m/min to 100 m/min.